(B) AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method for seismic acquisition, comprising

generating idealized subsurface illumination using idealized survey data;

performing the following during each of a sequence of time intervals during a seismic survey:

collecting an incremental portion of actual survey data, using data acquisition equipment at a data acquisition location;

communicating the incremental portion of actual survey data from the data acquisition location to a data processing location; ~~and~~

generating an incremental portion of actual subsurface illumination using the incremental portions of actual survey data; and

appending the incremental portion of actual subsurface illumination to previously generated portions of actual subsurface illumination from previous time intervals, to incrementally generate actual subsurface illumination at the data processing location;

determining if additional data acquisition is desirable by comparison of the idealized subsurface illumination and the actual subsurface illumination, in the data processing location; and

performing any desirable additional data acquisition before the data acquisition equipment leaves the data acquisition location.

2. (Original) The method of claim 1, wherein the step of generating idealized subsurface illumination comprises:

generating a 3D earth model; and

applying ray trace illumination modeling, using the 3D earth model and the idealized survey data.

3. (Original) The method of claim 2, wherein the step of generating a 3D earth model comprises:

determining surface data;

determining velocity data; and

generating a 3D earth model using the surface data and the velocity data.

4. (Original) The method of claim 1, wherein the idealized survey data comprises idealized source and receiver locations for the seismic survey.

5. (Original) The method of claim 1, wherein the actual survey data comprises actual source and receiver locations from the seismic survey.

6. (Original) The method of claim 1, wherein the step of collecting incremental portions of actual survey data comprises:

selecting a sequence of time intervals that span the seismic survey, and

collecting the incremental portions of actual survey data during each of the time intervals in the sequence.

7. (Original) The method of claim 1, wherein the step of communicating an incremental portion of actual survey data uses a satellite communications link.

8. (Original) The method of claim 1, wherein the step of a communicating an incremental portion of actual survey data further comprises:

compressing the incremental portion of actual survey data;
communicating the compressed survey data; and
de-compressing the communicated survey data.

9. (Original) The method of claim 1, wherein the step of a communicating an incremental portion of actual survey data further comprises:

decimating the incremental portion of actual survey data;
communicating the decimated survey data; and
de-decimating the communicated survey data.

10. (Original) The method of claim 1, wherein the step of a communicating an incremental portion of actual survey data further comprises:

reformatting the communicated survey data for ray trace illumination modeling.

11. (Currently amended) The method of claim 1, wherein the step of generating an incremental portion of actual subsurface illumination comprises:

applying ray trace illumination modeling using the 3D earth model and the incremental portion of actual survey data[[;]]
~~generating an incremental portion of actual subsurface illumination; and~~
~~appending the incremental portion of actual subsurface illumination to previously generated portions of actual subsurface illumination from previous time intervals~~.

12. (Original) The method of claim 1, wherein the step of determining if additional data acquisition is desirable comprises:

generating surface-based CMP coverage displays;
comparing the surface-based CMP coverage displays, the idealized subsurface illumination, and the actual subsurface illumination; and
identifying areas of insufficient subsurface coverage from the comparison.

13. (Original) The method of claim 12, wherein the step of performing any desirable additional data acquisition further comprises:

applying ray trace illumination modeling using the 3D earth model and the idealized survey data, to generate new subsurface illumination.

14. (Original) The method of claim 1, wherein the step of performing any desirable additional data acquisition further comprises:

applying targeted illumination analysis to the areas of insufficient subsurface coverage to generate new survey data.

15. (Original) The method of claim 14, wherein the step of performing any desirable additional data acquisition further comprises:

communicating the new survey data to the data acquisition location; and
performing infill seismic acquisition using the new survey data.

16. (Original) A method for illumination monitoring for near real time infill acquisition in a seismic survey, comprising:

applying ray trace illumination modeling using idealized source and receiver locations in original source and receiver areas, respectively, in a data acquisition area to generate idealized subsurface illumination;
collecting actual source and receiver locations during the seismic survey;
applying ray trace illumination modeling in a data processing location, using the actual source and receiver locations to generate actual subsurface illumination;
determining insufficient subsurface coverage in near real time by comparison of the idealized subsurface illumination and the actual subsurface illumination;
determining new source and receiver areas in near real time that correct for the insufficient subsurface coverage; and
repeating the above steps with the new source and receiver areas substituted for the original source and receiver areas, respectively.

17. (Original) A method for illumination monitoring for near real time infill acquisition in a seismic survey, comprising:

applying ray trace illumination modeling using idealized source and receiver locations in original source and receiver lines, respectively, to generate idealized subsurface illumination;
collecting incremental portions of actual source and receiver locations using data acquisition equipment in a data acquisition location, during the seismic survey;
applying ray trace illumination modeling in a data processing location, using the incremental portions of actual source and receiver locations to generate incremental portions of actual subsurface illumination;
appending the incremental portions of actual subsurface illumination to previously processed actual subsurface illumination;
determining if additional data acquisition is desirable for correction of insufficient subsurface coverage by comparison of the idealized subsurface illumination and the actual subsurface illumination;
determining new source and receiver lines for desirable data acquisition that correct for the insufficient subsurface coverage; and
performing the desirable data acquisition by repeating the above steps with the new source and receiver lines substituted for the original source and receiver lines, respectively, before the data acquisition equipment leaves the data acquisition area.